



***UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IX***

EXPLANATION OF SIGNIFICANT DIFFERENCES (ESD #1)

to

July 1994 Record of Decision, Operable Unit Two
East Phoenix Groundwater Containment

MOTOROLA 52nd STREET SUPERFUND SITE

PHOENIX, ARIZONA

September 1999

I. Introduction:

The Motorola 52nd Street Superfund Site (Site) is located in Phoenix, Arizona in Maricopa County. The Site was listed on the NPL on October 4, 1989. The Arizona Department of Environmental Quality (ADEQ) was designated the lead agency at the Site. The United States Environmental Protection Agency Region IX (EPA) issued an Amended Administrative Order for remedial action (RA) at Operable Unit Two (OU2) and is now the lead agency for OU2 RA at the Site. The Arizona Department of Environmental Quality (ADEQ) is the support agency for OU2.

This Explanation of Significant Differences (ESD) modifies the interim remedial action selected by ADEQ and EPA in the OU2 Record of Decision (ROD), signed in July 1994. This ESD was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) section 117(c), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) section 300.435(c)(2)(i), and "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents", July 1999. This ESD is based on information contained in the Administrative Record for the Site.

This ESD is necessary due to developments during the design of the groundwater treatment system for OU2. The OU2 ROD specified either air stripping or ultraviolet oxidation as a treatment technology and reinjection as a beneficial end-use of treated groundwater. EPA and ADEQ have determined that the use of carbon adsorption and ultraviolet oxidation for groundwater treatment and the discharge of the treated groundwater to the Grand Canal for end-use are efficient and cost effective modifications to the selected remedy.

This ESD will become part of the Administrative Record File (NCP 300.825(a)(2)), and will be available for review from 8:00am to 5:00pm Monday through Friday, excluding holidays, at EPA Region IX Superfund Records Center, 95 Hawthorne St., San Francisco, CA and ADEQ's offices at 3033 N. Central Avenue, Phoenix, AZ, and at the Saguaro and Central Branches of the Phoenix Public Library, located at 2808 N. 46th Street and 1221 N. Central Avenue, respectively, which are open on evenings and weekends as well as during regular business hours.

II. Summary of Site History, Contamination Problems, and Selected Remedy:

Activities at the Motorola 52nd Street Superfund Site began with Motorola's reports of releases of hazardous substances from the Motorola Inc. Semiconductor Products Plant at 5005 East McDowell Road in Phoenix, Arizona. Investigations of this facility and of the AlliedSignal Inc. Turbine Engines facility located at 111 South 34th Street initiated under Arizona's Water Quality Assurance Revolving Fund (WQARF) program identified these facilities as potential sources of groundwater contamination. Figure 1 shows the relative locations of the Motorola and AlliedSignal facilities within the Phoenix area. The combined releases from source areas have created extensive groundwater contamination in the area. Figure 2 shows the currently known extent of trichloroethylene (TCE) contamination. Other volatile organic contaminants (VOCs)

are also present; however, the known areal extent of TCE contamination reasonably encompasses the other contaminants.

A Consent Order was executed in July 1989 between ADEQ and Motorola for the design and implementation of Operable Unit One (OU1). OU1 addresses solvents in on-site soils and the containment of groundwater contamination from the Motorola facility to approximately 40th Street near the Old Crosscut Canal. The OU1 groundwater treatment system, located in the courtyard of the Motorola plant, has been in operation since May 1992. The on-site soil vapor extraction (SVE) treatment system operated in 1992 and 1997.

Volatile organic compounds (VOCs) in concentrations exceeding the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) for drinking water have been detected in groundwater extending well beyond 40th Street. ADEQ and EPA selected groundwater extraction and treatment at Washington Street and the Interstate 10 Freeway as the interim remedial action for OU2. The interim remedy is described in the Record of Decision, Operable Unit Two, East Phoenix Groundwater Containment, Motorola 52nd Street Superfund Site (7/21/94) (the OU2 ROD). This ROD is located in the Administrative Record File.

OU2 addresses groundwater contamination in the area west of the Old Crosscut Canal and east of Interstate 10. The contaminants of concern for OU2 are TCE, tetrachloroethylene (PCE), 1,1,1-trichloroethane (TCA), and their associated degradation products, including vinyl chloride. The primary remedial action objectives of OU2 are to establish a capture zone across the entire width and depth of the contaminant plume in the area of Interstate 10 and to reduce contaminant concentrations within the alluvial aquifer upgradient of the extraction wells. Hydrogeologic data collected during this interim action will facilitate development of a final remedy for the Superfund Site. On November 30, 1998, EPA issued an Administrative Order (No. 98-15) to Motorola and AlliedSignal to conduct the remedial action for the OU2 Interim Remedy.

The major components of the 1994 selected remedy for OU2 include:

- Installation of wells and extraction of groundwater in the vicinity of Interstate 10 and Van Buren Street;
- Treatment of extracted water near extraction locations by either air stripping with off-gas treatment by synthetic resin adsorption, or advanced oxidation based on final design considerations; and
- Installation of injection wells and injection of treated water back into the aquifer in locations allowing additional control of the contaminant plume.

The extracted water was to be treated for VOCs to meet drinking water standards. The OU2 ROD states that treatment of the extracted groundwater for removal of VOCs will be accomplished using either air stripping (with treatment of air emissions and off-site incineration of recovered solvents) or advanced oxidation (which utilizes ultraviolet light to destroy VOCs). These two technologies are discussed in detail in the Interim Remedy Feasibility Study. This

report is located in the Administrative Record File. According to the OU2 ROD, the treated water would be injected back into the ground. Injection wells were to be located east of Interstate 10 at the northern edge and central portion of the plume.

The extraction and treatment system is expected to contain approximately 2.6 square miles of the contaminant plume beyond OU1 and to remove approximately 2000 gallons of TCE from the aquifer over a 20 year period. (Gallons of TCE removed is provided for comparison purposes. Other VOCs will also be removed.) The ROD requires that the capture zone be achieved within one year of system start-up.

III. Description of the Significant Differences and the Basis for those Differences:

The major components of the revised remedy for OU2 include:

- Installation of wells and extraction of groundwater in the vicinity of Interstate 10 and Van Buren Street (as designated in the OU2 ROD);
- Treatment of extracted water to drinking water standards using carbon adsorption and ultraviolet oxidation at a treatment plant located near extraction wells; and
- Discharge of treated water to the Salt River Project (SRP) Grand Canal and used for agricultural irrigation and agricultural livestock.

Documents supporting the changes described below include the OU2 Remedial Design Work Plan, the OU2 Preliminary (30%) Design, and the OU2 Pre-final (90%) Design Reports, all of which can be found in the Administrative Record File. The estimated 30-year present value cost (at 5% interest) to construct and operate the revised treatment system is \$24 million. This is less than the \$31 million estimated in the ROD for the selected remedy.

A. Use of Ultraviolet Oxidation and Carbon Adsorption In Lieu of Air Stripping:

The 1994 ROD specified the use of air stripping of the contaminated groundwater with off-gas treatment of the volatilized contaminants by synthetic resin adsorption, and, if effective and economical, the use of advanced oxidation in lieu of the air stripping technology. In addition to air stripping and advanced oxidation, the FS evaluated the use of granular activated carbon as well. During the design, each treatment alternative was further evaluated for effectiveness and cost. The 30% and 90% Remedial Designs propose a combination of carbon adsorption and ultraviolet oxidation to be the most effective and economical treatment. Therefore, to eliminate air emissions and to reduce costs, an advanced oxidation pre-treatment (for vinyl chloride treatment) combined with continual granular activated carbon treatment is being chosen to replace air stripping as the treatment alternative for the groundwater. The used carbon will be sent off-site for regeneration, re-use or disposal. The new treatment system must still be able to treat the extracted water at rates sufficient to maintain hydraulic capture as well as meet drinking water standards.

B. Discharge to the Grand Canal In Lieu of ReInjection:

The Supplement to the Interim Remedy Feasibility Study Report, December 1993, presented Alternative 64C, describing a remedial action designed to pipe the treated water to the Grand Canal for irrigation use, rather than reinjection of the treated water back into the aquifer. Comments on the Proposed Plan suggested that this alternative was preferred by the community because the costs and traffic disruptions were lower and because there would be a more immediate beneficial use of the treated water. At the time the remedy selection was being made, it did not appear feasible for Salt River Project (SRP), which maintains and operates the canal, to take the treated water. During the past several years, however, SRP and Motorola have reached an agreement wherein SRP will accept all of the treated water for use with agricultural irrigation and livestock (3/1/99 letter from Motorola & SRP to ADEQ & EPA).

Although reinjection is typically considered by the Arizona Department of Water Resources (ADWR) to be the most preferred beneficial end-use of remediated groundwater, discharge to the canal is still considered an appropriate beneficial end-use. There will be significant costs saving to the remedy since long-term operation and maintenance costs associated with reinjection to the aquifer are much higher than with discharge to the canal. There is no expected increase of risk to human health and the environment since the treatment standards are also protective for the designated end-use. Discharge to the canal will result in less disruption to the community since there will be a new pipeline route in a less dense area with wider streets, and there will no longer be a need for reinjection well construction. Discharge to the Grand Canal, and therefore operation of the groundwater treatment system, will be interrupted for approximately one month every year. Motorola has provided documentation that supports that this interruption in pumping will not impact groundwater capture efficiency and would have also been necessary with reinjection to allow for reinjection well cleaning and well/piping maintenance and repairs (11/23/98 letter from Motorola to ADEQ).

C. Applicable or Relevant and Appropriate Requirements (ARARs)

The 1994 ROD included action-specific ARARs for air stripping and reinjection. As air stripping and reinjection are no longer necessary for the remedy, the following requirements identified in the 1994 ROD are no longer ARARs:

- 40 C.F.R. Part 265, Subpart AA and BB, Resource Conservation and Recovery Act (RCRA) requirements applicable to air stripper emissions
- EPA OSWER Directive 9355.0-2.8 (June 1989) concerning air stripper emissions from air strippers used for groundwater treatment at Superfund sites.
- Arizona Hazardous Waste Management Act, AAC R18-8-264 & 40 CFR Subpart X requirements for miscellaneous RCRA units.
- Arizona Revised Statutes for discharge to an Aquifer A.R.S. §49-241 through 49-244, and implementing regulations, A.A.C. R18-9-101, et seq.

The following additional ARARs are added to the 1994 ROD with respect to the revised remedy:

- Federal Hazardous Materials Transportation Law, 49 U.S.C. §§ 5401, et seq. (formerly the Hazardous Materials Transportation Act) and associated rules, 40 C.F.R. Parts 107, 171.1 - 172.558. This law regulates the transportation of hazardous substances.
- Section 402 of the Clean Water Act, 33 U.S.C. §1342 requires a National Pollutant Discharge Elimination System ("NPDES") permit for discharge of pollutants to waters of the United States. Discharge to the Grand Canal is within the Site boundary, therefore, the substantive requirements of §402 of the Clean Water Act is an ARAR.

In summary, EPA and ADEQ expect that this remedy will contain the same volume of water, remove the same amount of VOCs, and achieve the capture zone within one year of system start-up, as in the originally selected remedy.

IV. Support Agency Comments:

The lead agency (EPA) and support agency (ADEQ) jointly developed this ESD. The support agency has no additional comments.

V. Affirmation of the Statutory Determinations:

Considering the new information that has been developed and the changes that have been made to the selected remedy, ADEQ and EPA believe that the revised remedy remains protective of human health and the environment, and is cost effective. The revised remedy complies with federal and state requirements identified in the ROD or the Interim Remedy Feasibility Study as ARARs at the time the ROD was signed, with the exception of those federal or state requirements that are no longer ARARs for the revised remedy. The OU2 remedy is an interim remedy and is not intended to fully address the statutory mandate for permanent solutions and alternative treatment technologies to the maximum extent practicable for the site (section 121 of CERCLA). Changes to the remedy documented in this ESD will not be inconsistent with the Final ROD.

VI. Public Participation Compliance:

The public participation requirements set out in the NCP section 300.435(c)(2)(i) have been met. ADEQ issued one fact sheet and has held two open house public meetings in the OU2 area during the OU2 remedial design process, allowing public participation regarding the proposed design. EPA's Technical Assistant Grant recipients, the Gateway Neighborhood, have participated in technical meetings during the design review. SRP notified their irrigation customers that they will be accepting treated water from the Site in an August 1999 newsletter. There has been no response from SRP customers to date.

Public notice will be issued in the *Arizona Republic* newspaper that the ESD has been signed and that the contents of the Administrative Record File are available. EPA will also prepare a fact sheet announcing the ESD and approval of the Final (100%) Remedial Design and will hold public meetings prior to start of construction.

Keith Takata

Keith Takata, Director
Superfund Division
USEPA Region IX

9-10-99

Date

Jean A. Calhoun, Director
Waste Programs Division
Arizona Department of Environmental Quality

Date

Keith Takata, Director
Superfund Division
USEPA Region IX

Date



Jean A. Calhoun, Director
Waste Programs Division
Arizona Department of Environmental Quality

8/15/99
Date

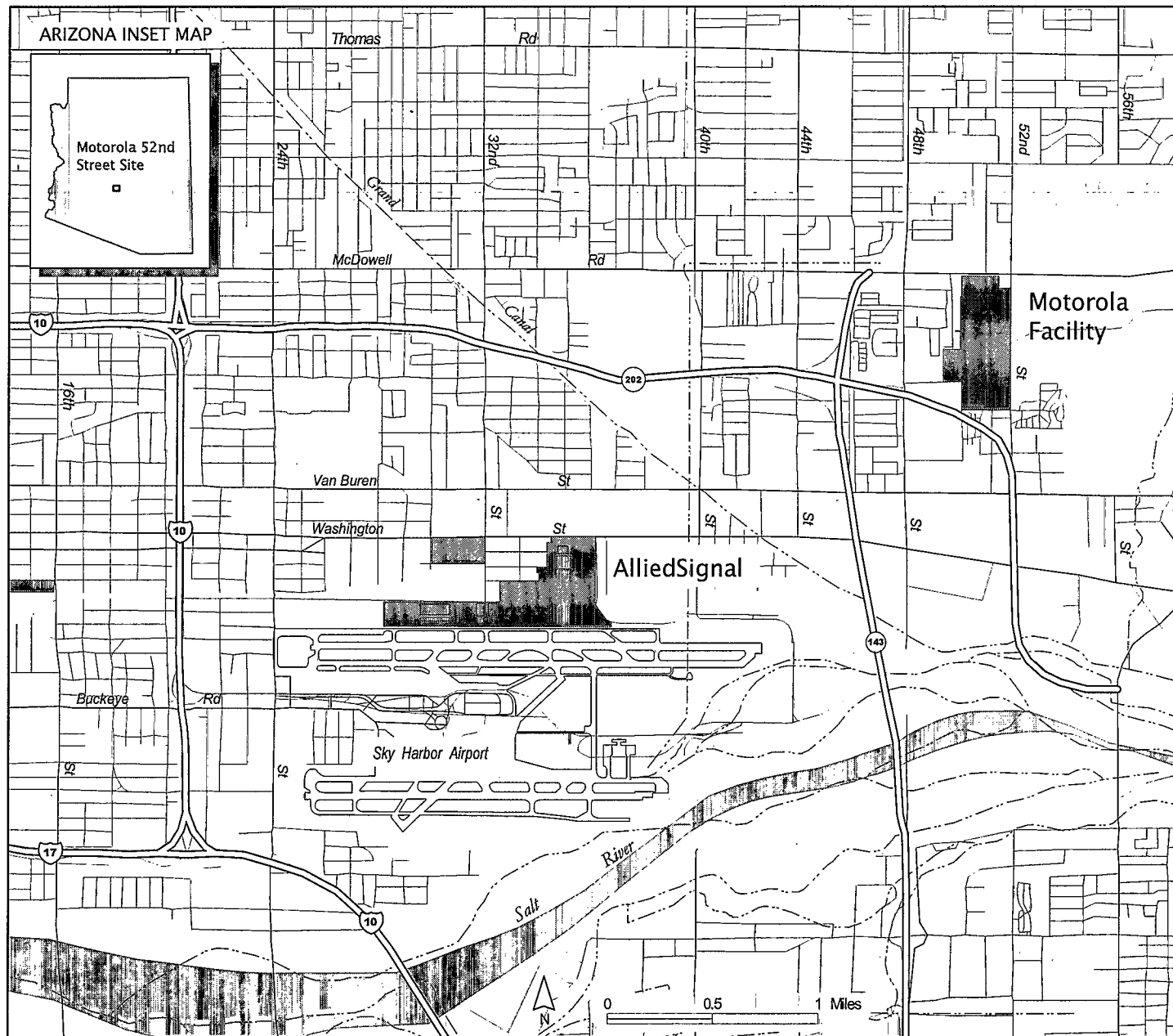
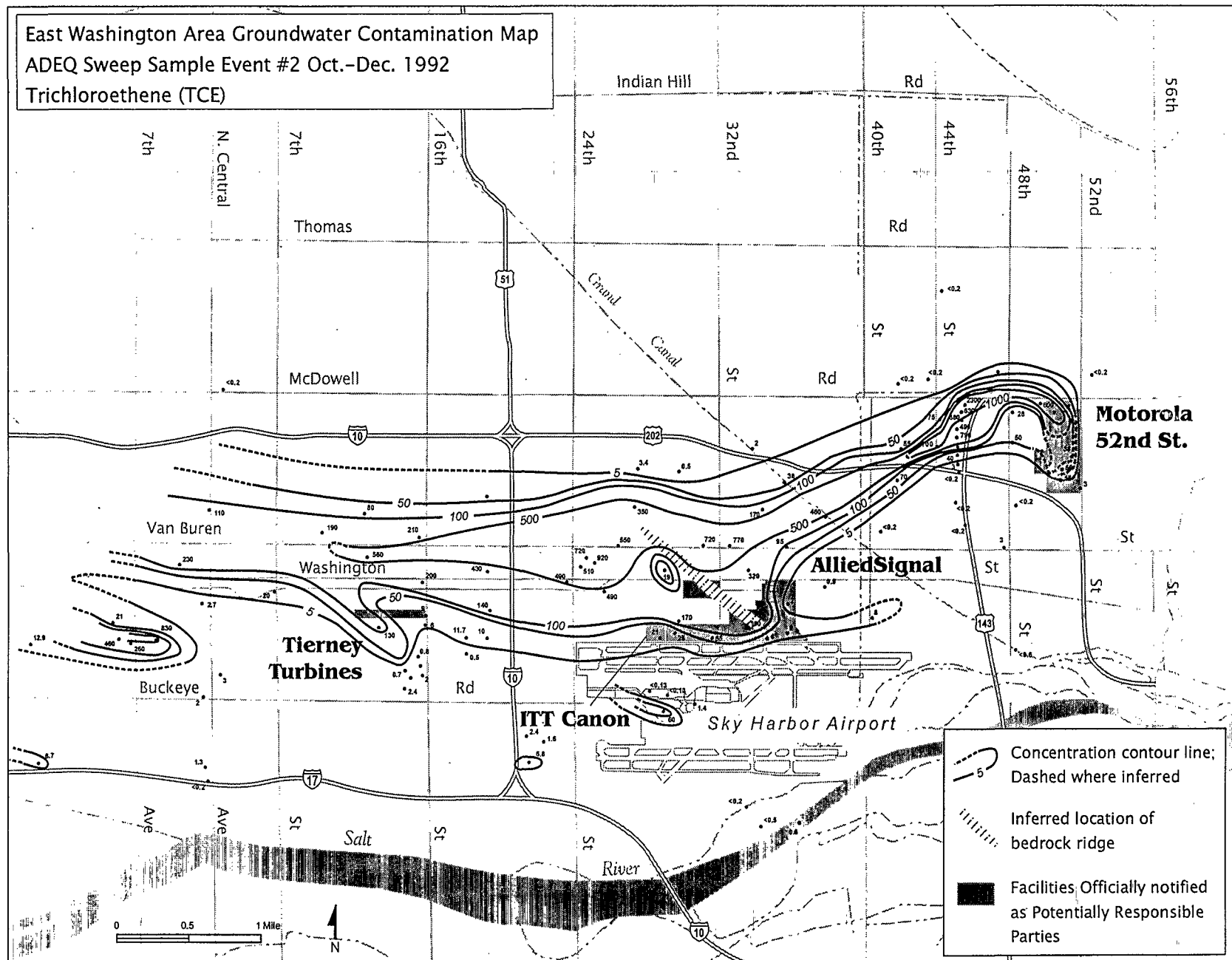


Figure 1. Site Vicinity Map

Figure 2. Extent of TCE Contamination in Groundwater

ESD #1 Motorola 52nd St. OU2



All concentrations in micrograms per liter (parts per billion or ppb)

Adapted from 1994 OU2 Record of Decision